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09/359,599	07/23/1999	TAD HOGG	XERX1016MCF/	3028

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FLIESLER DUBB MEYER & LOVEJOY, LLP
FOUR EMBARCADERO CENTER
SUITE 400
SAN FRANCISCO, CA 94111

EXAMINER
FERRIS III, FRED O

ART UNIT	PAPER NUMBER
2123	8

DATE MAILED: 10/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/359,599	Applicant(s) HOGG, TAD	
	Examiner Fred Ferris	Art Unit 2123	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _14 August 2003_ .

2a)☒ This action is **FINAL.** 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-27_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-27_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _23 July 1999_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4)☐ Interview Summary (PTO-413) Paper No(s). _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: .

DETAILED ACTION

1.　　Claims 1-27 have been presented for examination based on applicant's request for reconsideration received 14 August 2003 (Paper # 7). Claims 1-27 remain rejected by the examiner.

Response to Arguments

2.　　Applicant's arguments filed 14 August 2003 (Paper # 7) have been fully considered but they are not persuasive.

　　　Regarding applicant's response to drawing objections: Applicants have submitted formal drawings that have been approved by the examiner. Accordingly, the examiner withdraws the objection to the drawings.

　　　Regarding applicant's response to 35 USC 101 rejection: Applicants have argued that pending claims 1-27 meet statutory subject matter requirements and have referenced the Federal Circuit Court's ruling regarding *State Street* and *Excel Communications* in arguments relating to practical application of the claimed invention. The examiner agrees that, in the case of Excel (now U.S. 5,333,184), claims are in fact drawn to statutory subject matter. For example claim 1 of U.S. 5,333,184 recites:

"1.　　A method for **use in a telecommunications system** in which **interexchange calls initiated by each subscriber** are automatically **routed over the facilities of a particular one of a plurality of interexchange carriers** associated with that subscriber, said method comprising the steps of:

generating a message record for an **interexchange call between** an **originating subscriber and a terminating subscriber**, and

including, in said **message record**, a **primary interexchange carrier (PIC) indicator** having **a value** which is a function of **whether or not** the **interexchange carrier** associated with said **terminating subscriber** is **a predetermined one** of said **interexchange carriers**."

Claim 1 of U.S. 5,333,184 meets the requirements by being "useful" (i.e. a telecommunications system inter-exchanging calls initiated by subscribers routed over facilities), "tangible" (i.e. generating a message record for an inter-exchange call between an originating and terminating subscriber), and "concrete" (i.e. the result is assured since the PIC has a value contained in the message record indicating inter-exchange carrier association)

In sharp contrast, the pending claims of the present invention clearly do not recite a similar practical "useful" application of the output and are not drawn to a concrete and tangible result. For example, claim 1 of the present invention recites:

1.   A method for computing a diversity measure for a predetermined combinatorial structure C having n elements, the method comprising steps of:

(a)   identifying M structures C_1 through C_M each having m elements from among the n elements of the predetermined combinatorial structure C, where M equals $n! / [(n-m)! \, m!]$;

(b)   for each substructure for l from 1 to M, determining a number n_i of the M substructures c_1 through c_M that are similar to the substructure c_i; and

(c)   computing a first entropy $\Phi(m)$ based upon all the numbers n_i computer during step (b) and based upon M in computed step (a).

In this case, the claim recites no limitations relating to a practical application and the term "diversity measure" is not defined by the language of the claim. The output is simply a number with no limitations indicating a "tangible" application of the result. Accordingly, the examiner maintains the 35 USC 101 rejection of claims 1-27.

Regarding applicant's response to 112(1) rejections: Applicant's have argued that the specification for claimed invention uses "broad terminology" to describe how a combinatorial structure is categorized and its diversity measured and that the examiner

has not indicated non-enabled claim elements. The examiner agrees with applicant's

admission that the specification "broadly" describes <u>well-known techniques</u> relating to

diversity in combinatorial structures, <u>as does the cited prior art</u>. Regarding examiner's

indication of non-enabled claim elements the MPEP 706 recites:

"UNIFORM APPLICATION OF THE PATENTABILITY STANDARD

The standards of patentability applied in the examination of claims must be the same
throughout the Office. In every art, whether it be considered "complex," "newly
developed," "crowded," or "competitive," all of the requirements for patentability (e.g.,
novelty, usefulness and unobviousness, as provided in 35 U.S.C. 101, 102, and 103)
must be met before a claim is allowed. The mere fact that a claim recites in detail all of
the features of an invention (i.e., is a "picture" claim) is never, in itself, justification for the
allowance of such a claim.

An application should not be allowed , unless and until issues pertinent to patentability
have been raised and resolved in the course of examination and prosecution, since
otherwise the resultant patent would not justify the statutory presumption of validity (35
U.S.C. 282), nor would it "strictly adhere" to the requirements laid down by Congress in
the 1952 Act as interpreted by the Supreme Court. <u>The standard to be applied in all
cases is the "preponderance of the evidence" test</u>. In other words, <u>an examiner should
reject a claim if, in view of the prior art and evidence of record, it is more likely than not
that the claim is unpatentable."</u>

In the cited prior art Popovic, for example, teaches the use of combinatorial

structures relating to <u>image processing and geometric structures</u>, Iwata teaches

combinatorial structures in <u>game theory and information theory</u>, while Malomsoky

teaches entropy measurement in virtual network paths.

Since neither the applicant's arguments, the specification, nor the claims, provide

a teaching of the claimed inventions use with anything other than web-based

applications, the examiner asserts that the claims do not meet the requirements of the

"preponderance of evidence" test as required by MPEP 706 above. The specification

contains only teachings relating to web structures and provides _no motivation_ and _no teaching_ (i.e. _evidence_) for the claimed inventions use with anything other than web based applications. _Applicants are invited to direct the examiner to the specific sections of the specification that contain teachings of the claimed inventions use with other than web-based applications._

Applicants also appear to be engaging in circular reasoning by arguing that, on the one hand, the claimed invention is "useful as it allows for greater ease of searching and classifying web pages" and citing the specification passage stating "As agent based web services develop, maintaining diversity is applicable to help ensure a full range of services" (see paper #7: page 15, lines 4-7, Specification: page 5), and then later arguing that "the word _web_ does not appear at any point in the figures" (paper #7, page 16, line 9). (The examiner invites applicants to read the last paragraph on page 3 of the specification which indicates that features relating the inventions use in "_modeling the Web_" are "_illustrated in the figures_") These passages only further bolster the examiners position that the specification for the claimed invention does not provide enablement for anything other than web-based applications. In addition, since the claimed invention does not produce a concrete, tangible, and useful result one skilled in the art would not know how to make and/or use the invention.

Accordingly, the examiner maintains the 112(1) rejection.

Regarding applicant's response to 103(a) rejection: Applicants argue that prior art does not teach identifying substructures, predetermined combinatorial substructures, determining similarity, or computing entropy. While the applicants have not addressed

the specific merits of the prior art rejections, the examiner asserts that prior art clearly

discloses the claimed limitations as cited in the previous office action. For example,

Popovic clearly discloses determining (identifying) substructures (Figs. 2A-3),

determining similarity (Fig. 7), and predetermined combinatorial substructures (CL3-

L32-65), while Malomsoky discloses computing entropy (Fig. 12A, CL13-L63) as

previously cited. (please see 103(a) rejection below)

Further, the examiner has determined that the specification for the claimed

invention is delinquent in the areas cited under 112(1) and 101 rejections, and has

therefore made prior art rejections based on the <u>limited scope of information contained</u>

<u>in the specification</u> and a good faith <u>interpretation of the language of the claims</u>.

Accordingly, the examiner maintains the 103(a) rejections.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3.   *Claims 1-27 are rejected under 35 U.S.C. 101 because the claimed invention*

lacks patentable utility. Specifically, claims 1-27 are drawn to a method for computing

diversity for a predetermined combinatorial structure. The Examiner submits that

Applicant's have not <u>recited</u> any limitations relating to a practical application in the

technological arts. (see MPEP 2106)

An invention which is eligible for patenting under 35 U.S.C. § 101 is in the "useful

arts" when it is a machine, manufacture, process or composition of matter, which

produces a concrete, tangible, and useful result. The fundamental test for patent eligibility is thus to determine whether the claimed invention produces a "useful, concrete and tangible result." The test for practical application as applied by the examiner involves the determination of the following factors:

(1) "Useful" - The Supreme Court in Diamond v. Diehr requires that the examiner look at the claimed invention as a whole and compare any asserted utility with the claimed invention to determine whether the asserted utility is accomplished.

(2) "Tangible" - Applying In re Warmerdam, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994), the examiner will determine whether there is simply a mathematical construct claimed, such as a disembodied data structure and method of making it. If so, the claim involves no more than a manipulation of an abstract idea and therefore, is nonstatutory under 35 U.S.C. § 101. In Warmerdam the abstract idea of a data structure became capable of producing a useful result when it was fixed in a tangible medium which enabled its functionality to be realized.

(3) "Concrete" - Another consideration is whether the invention produces a "concrete" result. Usually, this question arises when a result cannot be assured. An appropriate rejection under 35 U.S.C. § 101 should be accompanied by a lack of enablement rejection, because the invention cannot operate as intended without undue experimentation.

The Examiner respectfully submits, under current PTO practice, and in view of the 112(1) rejections, that the claimed invention does not recite either a useful, concrete, or tangible result and is merely drawn to a mathematical algorithm.

- The invention is not useful as a result of the 112(1) rejections which make it difficult to determine Applicant's invention.

- *The claims are not concrete because the results are not assured. Is a solution possible for any and all arbitrary inputs? For example, is it possible to compute a diversity measure for any combinatorial structure, or only for Web based components as described in the specification? (see specification page 5, line 7)*

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4.   *Claims 1-27 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for <u>web based applications</u>, does not reasonably provide enablement for computing a diversity measure for any combinatorial structure. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.*

Specifically, claims 1-27 are drawn to computing a diversity measure for a predetermined combinatorial structure. Applicant's specification refers to uses for the claimed that are drawn solely to modeling web pages or groups of web pages (page 2, line11) and has not disclosed or <u>claimed</u> any other practical application for the claimed invention. Accordingly, the specification does not provide enablement for computing the diversity of <u>any</u> combinatorial structure.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

5.   *Claims 1-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over*

U.S. Patent 6,304,639 issued to Malomsoky et al in view of U.S. Patent 5,966,140

issued to Popovic et al.

Independent claims 1 is drawn to:
Method, computer code, and system for computing diversity measure of a combinatorial structure by:
Identifying substructures (sets) among elements of combinatorial structure
Determining similar substructures from sets
Computing entropy from similar sets

Regarding independent claims 1, 10, and 19: Malomskoy discloses a *method*,

computer readable medium, and *system* that computes the *blocking of paths*

(unavailability) within a virtual network structure by identifying sets (substructures)

among the elements of the network structure and determining an entropy-blocking

measure (computing entropy). For example, at column 3, line 49 Malomskoy recites,

"The relationship between offered traffic and other computational parameters is
modeled on the telecommunications network using an entropy-blocking measure and
capacities are allocated to the plurality of virtual paths subject to the transmission
capacity constraints for the various physical links such that the blocking probabilities
on the various virtual paths are made as uniform as possible within a preselected error
bound."

A description of the method for computing the entropy-blocking measure is

disclosed at column 15, line 3 to column 18, line 65. (Also see, Abstract, Summary of

the Invention, CL4-L59-Cl5-L33, CL10-L20-CL1-L45, Figs. 1, 6, 8, 9, 12)

Malomskoy mentions, but does not explicitly teach combinatorial structures.

Popovic teaches a method for creating combinatorial structures consisting of

sets of substructures of elements representing a model structure and methods for

comparing (determining) sets with similar substructures within the model structure.

(Abstract, Summary of Invention, CL6-L20-CL9-L30, CL9-L34-CL11-L10, CL11-L16,

CL12-L28, CL18-L47, Figs. 2-6, 8-13)

It would have been obvious to one having ordinary skill in the art at the time the

claimed invention was made to modify the teachings of Malomskoy relating to a

method and system for computing the blocking of paths (unavailability) within a virtual

network structure by identifying sets among the elements of the network structure

and determining an entropy-blocking measure (computing entropy), with the

teachings of Popovic relating to creating combinatorial structures consisting of sets

of substructures of elements to realize the claimed invention. An obvious motivation

exists since, as referenced in the prior art, computing network unavailability and

blocking using entropy-measure techniques provides a more efficient model that uses minimal computational resources.

Regarding dependent claims 2-9, 11-18, and 20-27: This group of claims simply relates to methods for computing entropy in measuring network blocking which is taught by Malomskoy as disclosed above, and the numbering of element sets, determining similar substructures, distance functions, and isomorphic structures, which is taught by Popovic as also disclosed above.

Conclusion

6.   *THIS ACTION IS MADE FINAL.* Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, careful consideration should be given prior to applicant's response to this Office Action.

U.S. Patent 5,703,792 issued to Chapman teaches measuring diversity in combinatorial molecular structures.

"A Library for Visualizing Combinatorial Structures", M. Najork, pp. 164-171, IEEE 1070-2385/94, IEEE 1994 – teaches combinatorial structures.

"The Combinatorial Structure of Fuzzy Functional Dependencies", A. C. Sali, pp. 239-243, IEEE 0-7803-3627-5/97, IEEE May 1997 – teaches combinatorial structures.

"A Combinatorial, Strongly Polynomial-time Algorithm for Minimizing Submodular Functions", S. Iwata, STOC 2000, ACM 1-58133-184-4/00/5, 1999 teaches combinatorial structures.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred Ferris whose telephone number is 703-305-9670 and whose normal working hours are 8:30am to 5:00pm Monday to Friday.

Any inquiry of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is 703-305-3900.

The Official Fax Numbers are:

Official (703) 872-9306

Fred Ferris, Patent Examiner
Simulation and Emulation, Art Unit 2123
U.S. Patent and Trademark Office
Crystal Park 2, Room 2A22
Crystal City, Virginia 22202
Phone: (703) 305 - 9670
Fred.Ferris@uspto.gov
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